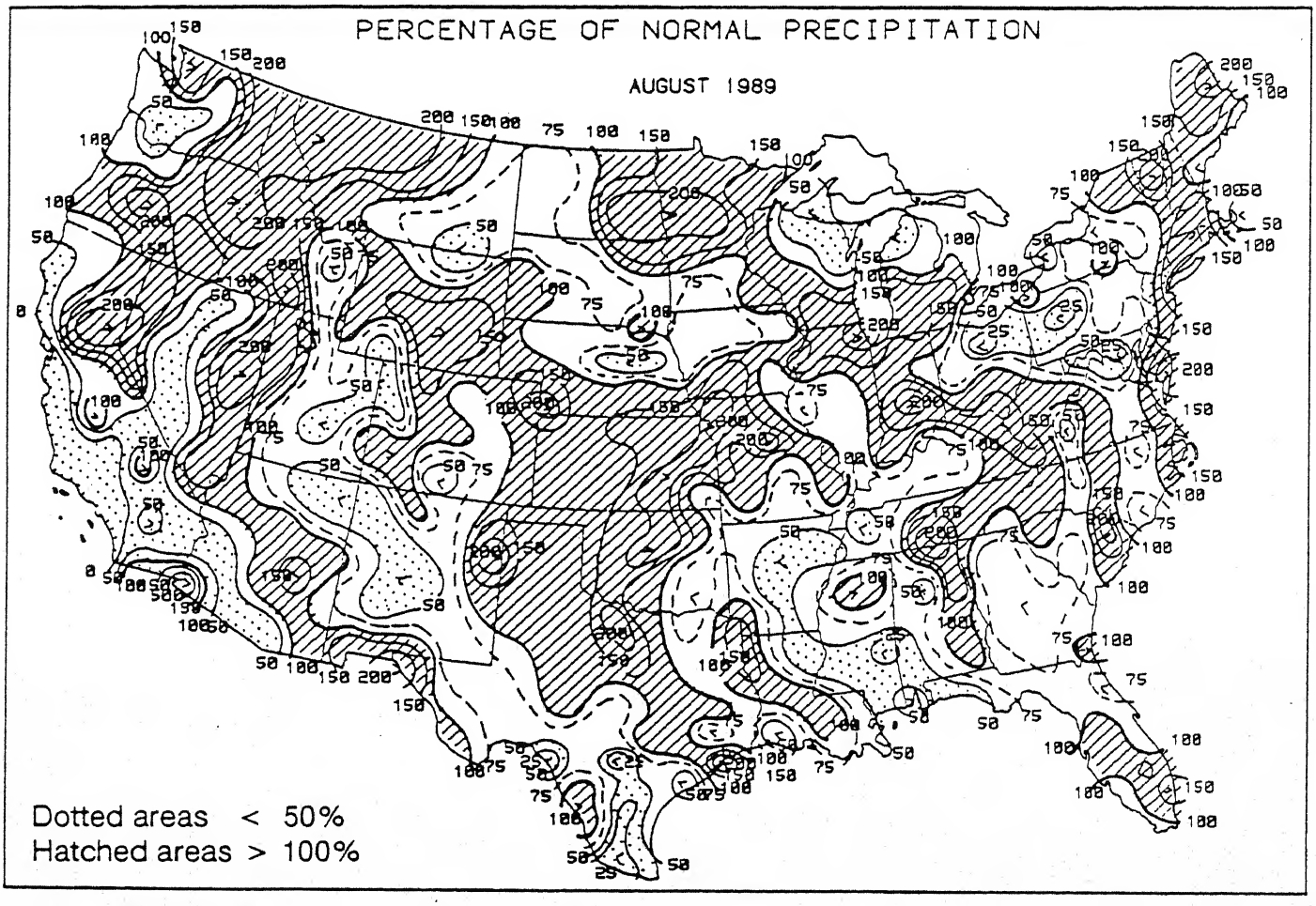
CLIMATE ANALYSIS CENTER

CONTAINS:
AUGUST 1989
UNITED
STATES
CLIMATE
SUMMARY

WEEKLY CLIMATE BULLETIN

No. 89/35 **Washington, DC** **September 2, 1989**



HEAVY AUGUST RAINS PROVIDED SIGNIFICANT RELIEF FROM LONG-TERM DRYNESS TO THE NORTHERN ROCKIES AND GREAT PLAINS, UPPER MIDWEST, AND LOWER MISSOURI VALLEY. FOR ADDITIONAL INFORMATION, REFER TO THE U.S. MONTHLY CLIMATE SUMMARY COMMENCING ON PAGE 9.

UNITED STATES DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL WEATHER SERVICE – NATIONAL METEOROLOGICAL CENTER

CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- Highlights of major climatic events and anomalies.
- U.S. climatic conditions for the previous week.
- U.S. apparent temperatures (summer) or wind chill (winter).
- U.S. cooling degree days (summer) or heating degree days (winter).
- Global two-week temperature anomalies.
- Global four-week precipitation anomalies.
- Global monthly temperature and precipitation anomalies.
- Global three-month precipitation anomalies (once a month).
- Global twelve-month precipitation anomalies (every three months).
- Global three-month temperature anomalies for winter and summer seasons.
- Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF SEPTEMBER 2, 1989

1. Western Canada and Alaska:

ANOMALOUS WARMTH CONTINUES.

A strengthening upper air ridge in northwestern Canada continued to provide unusual warmth to the area. Positive departures rose slightly from the previous week, with highest values approaching +6°C [5 weeks].

2. Caribbean Islands:

LIMITED RELIEF FROM DRYNESS.

Moderate rains (between 25 and 50 mm) continues to fall on the Windward Islands, easing moisture shortages. Otherwise, light amounts of less than 10 mm fell from scattered showers over Puerto Rico and the Leeward Islands [11 weeks].

3. Europe:

HEAT ABATES.

Cool, wet weather dominated the continent during the past week, lowering temperatures to below normal levels in most areas. Portions of Spain and France, however, reported departures approaching +3°C [Ending at 7 weeks].

4. Bulgaria, Romania, Moldavian and Ukrainian S.S.R.:

WESTERN PORTIONS RECEIVE OVERDUE RAINS.

Many stations reported their first significant precipitation in over two months as rainfall in excess of 50 mm (maximum of 96 mm) fell in western Ukrainian S.S.R. and adjacent areas. Meanwhile, continued deficient precipitation (less than 15 mm) has increased moisture shortages in eastern parts of the Ukraine [9 weeks].

5. Northeastern China:

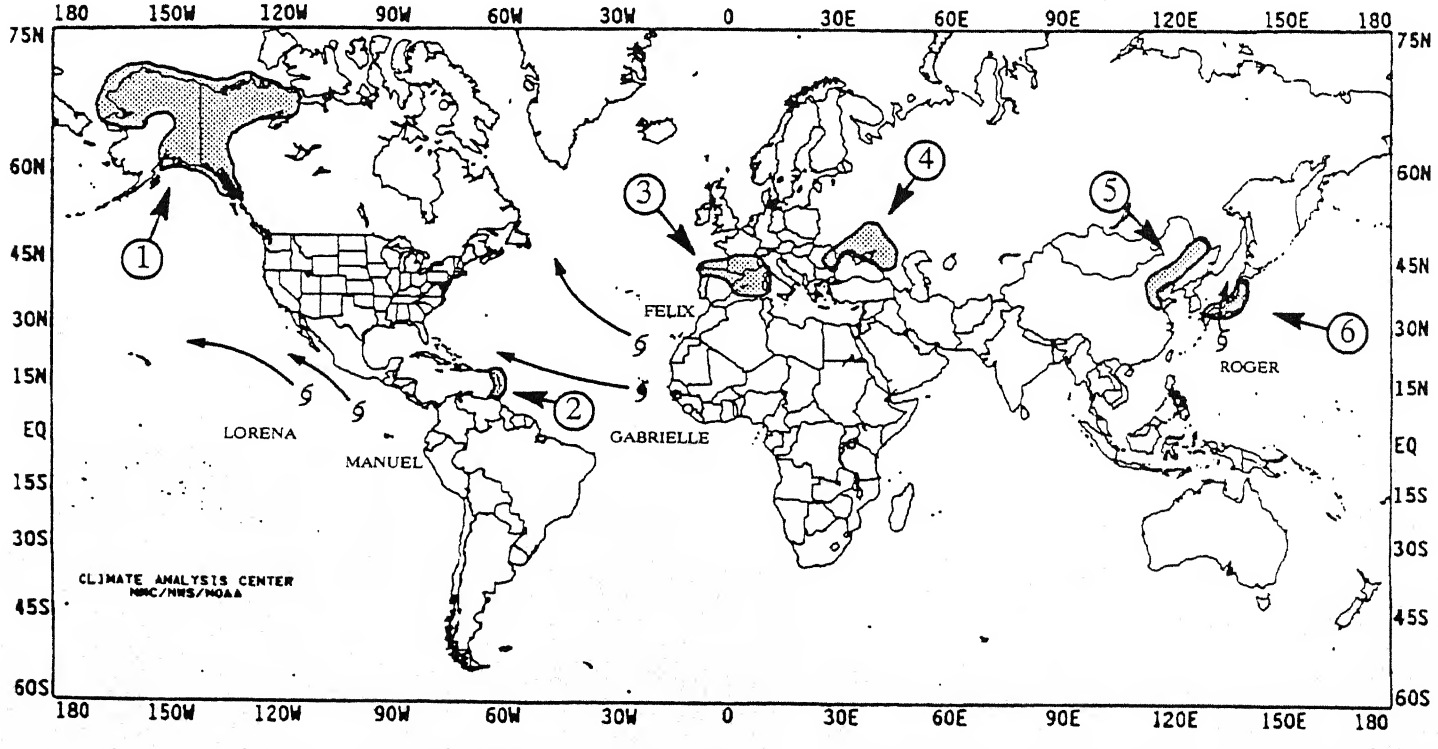
DRY CONDITIONS DEVELOP.

Precipitation from Shandong and Beijing northeastward into eastern Manchuria has been meager in recent weeks. Weekly totals were generally less than 10 mm with a few scattered reports in excess of 20 mm. During the past month, the majority of stations in the region have received less than one-quarter of normal rainfall [5 weeks].

6. Japan:

RAINS POUND JAPAN.

Tropical Storm Roger crossed Shikoku and Honshu early in the week, dumping nearly 167 mm in 24 hours over coastal areas of southern Honshu. Later, heavy rains associated with a frontal system swept across western Japan where maximum daily totals approached 176 mm. According to press reports, at least 85 landslides were noted while more than 1600 homes were flooded [Episodic Event].



EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF AUGUST 27 THROUGH SEPTEMBER 2, 1989

Excessively hot and sultry air dominated the southeastern quarter of the nation for the second consecutive week as apparent temperatures soared to dangerous levels (> 105°F) in many areas. In contrast, unseasonably cool and dry weather extended from the northern Rockies to the southern California coast on Monday and slowly pushed eastward to engulf most of the northern third of the nation by the weekend. Small waves of low pressure propagated along the boundary between these two air masses, generating large complexes of severe thunderstorms that produced large hail, hurricane-force wind gusts, inundating cloudbursts, and a few tornadoes. These storms drenched much of the upper Mississippi Valley, western Great Lakes, Corn Belt, and central Great Plains, giving the latter region a third consecutive week of extremely wet weather. Thunderstorm activity diminished as the waves moved eastward along the front and weakened; however, non-precipitating remnants from these storms caused extensive damage from lightning strikes in northern West Virginia. The storms set several fires, downed power lines, and razed trees which blocked several major thoroughfares. Isolated strong thunderstorms also developed in the hot, humid air in the South. Precipitation was slightly more widespread in Florida and along the central and eastern Gulf Coast, where a few tropical waves generated additional thunderstorm activity. Farther west, a warm front pushed into the Pacific Northwest late in the week. This triggered a rare outbreak of severe weather in western Oregon and in isolated parts of Idaho and western Montana as baseball-sized hail and damaging winds accompanied some of the storms. Heavy rains continued to pound south-central Alaska where Anchorage has received more than twice the normal precipitation since January 1. In contrast, southeastern sections of the state remained very dry. Heavy rains also plagued the eastern half of Hawaii Island, but the rest of the state experienced normal precipitation and near to slightly below normal temperatures.

According to the River Forecast Centers, the nation's heaviest precipitation (up to 7.4 inches) fell on central Illinois and Indiana (see Table 1). Widespread heavy rain, between 2 and 5 inches, soaked the central Great Plains eastward across the Corn Belt and northward into extreme southern Minnesota and Wisconsin. Heavy precipitation was scattered in a band from the Texas Panhandle eastward across Arkansas and in the southern half of the Mississippi Valley as isolated locations received up to 7.1 inches of rain. Up to five inches of rain drenched parts of western Georgia, South Carolina, and southern Florida, but most of the reporting stations received less than two inches. Light precipitation fell throughout the northern Great Lakes, mid-Atlantic, Northeast, southern High Plains, northern Rockies, and Pacific Northwest. Little or no precipitation occurred in southern Texas, the middle Missouri Valley, and the southwestern quarter of the nation.

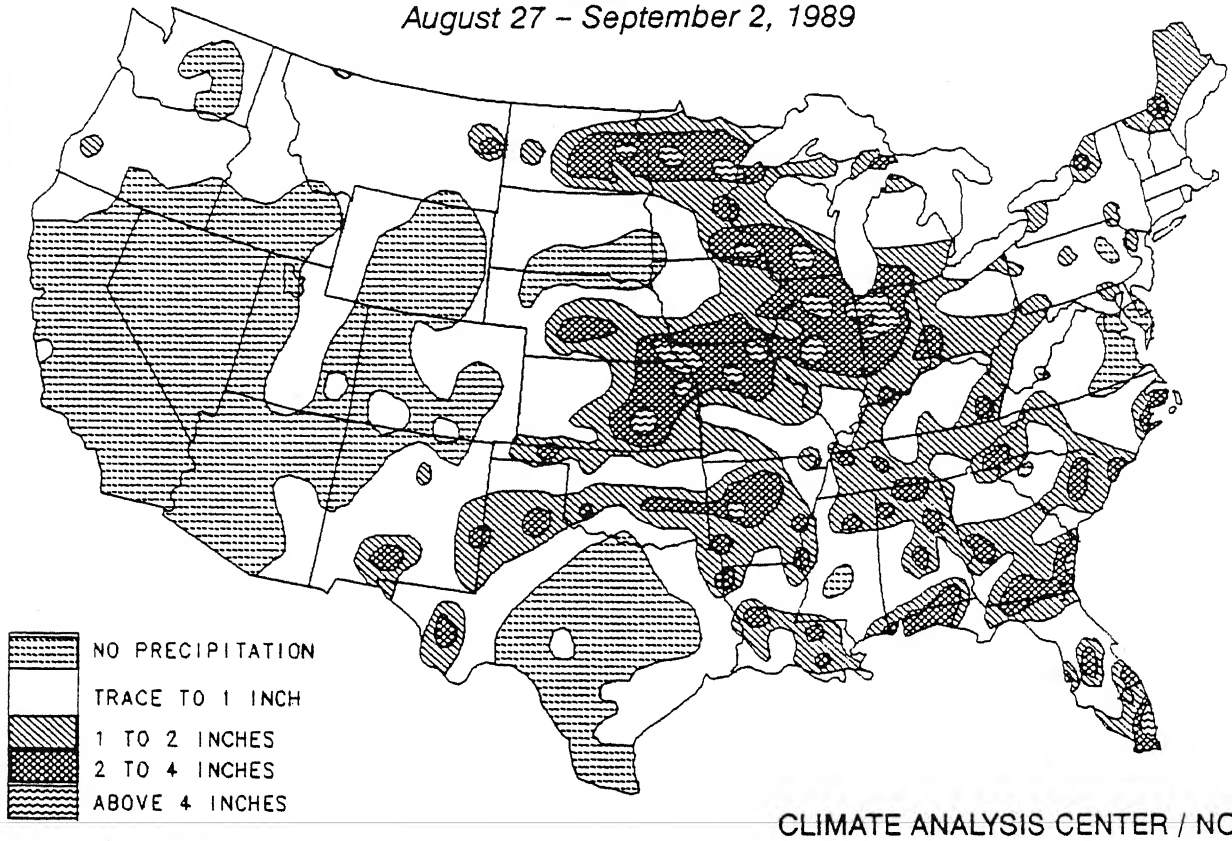
For the second consecutive week, high humidity accompanied readings in the nineties and one hundreds in the southern Great Plains, lower Mississippi Valley, and Southeast, producing apparent temperatures in excess of 105°F (see Figure 2). The greatest positive departures (between +5°F and +7°F) were found throughout the previously mentioned areas as well as the Tennessee Valley and central Rockies (see Table 2). Near to slightly above normal temperatures prevailed across the remainder of the eastern two-thirds of the country. An upper-air ridge centered over western Canada brought unusually mild weather to much of Alaska. In contrast, subnormal weekly temperatures dominated the Far West, southern Rockies, and extreme northern New England. Temperatures averaged between 3°F and 7°F below normal from southern California northeastward to North Dakota (see Table 3). Lows dipped below freezing in sections of the Great Basin and north-central Rockies (see Figure 1).

TABLE 1. Selected stations with 3.00 or more inches of precipitation for the week.

STATION	TOTAL (INCHES)	STATION	TOTAL (INCHES)
CORDOVA/MILE 13, AK	7.37	ILIAMNA, AK	3.51
MIAMI, FL	5.22	KANSAS CITY/INTL., MO	3.49
SPRINGFIELD, IL	4.91	MOLINE, IL	3.43
WICHITA/MCCONNELL AFB, KS	4.89	INDIANAPOLIS, IN	3.40
PERU/GRISSOM AFB, IN	4.70	CAPE HATTERAS, NC	3.38
MADISON, WI	4.11	WICHITA, KS	3.35
VALDEZ, AK	4.06	CHICAGO/O'HARE, IL	3.28
TAMPA, FL	3.89	ROCKFORD, IL	3.26
SOUTH BEND, IN	3.77	VERO BEACH, FL	3.25
MCALESTER, OK	3.68	ROCHESTER, MN	3.13
VALPARAISO/EGLIN AFB, FL	3.64	TOPEKA, KS	3.09

OBSERVED PRECIPITATION

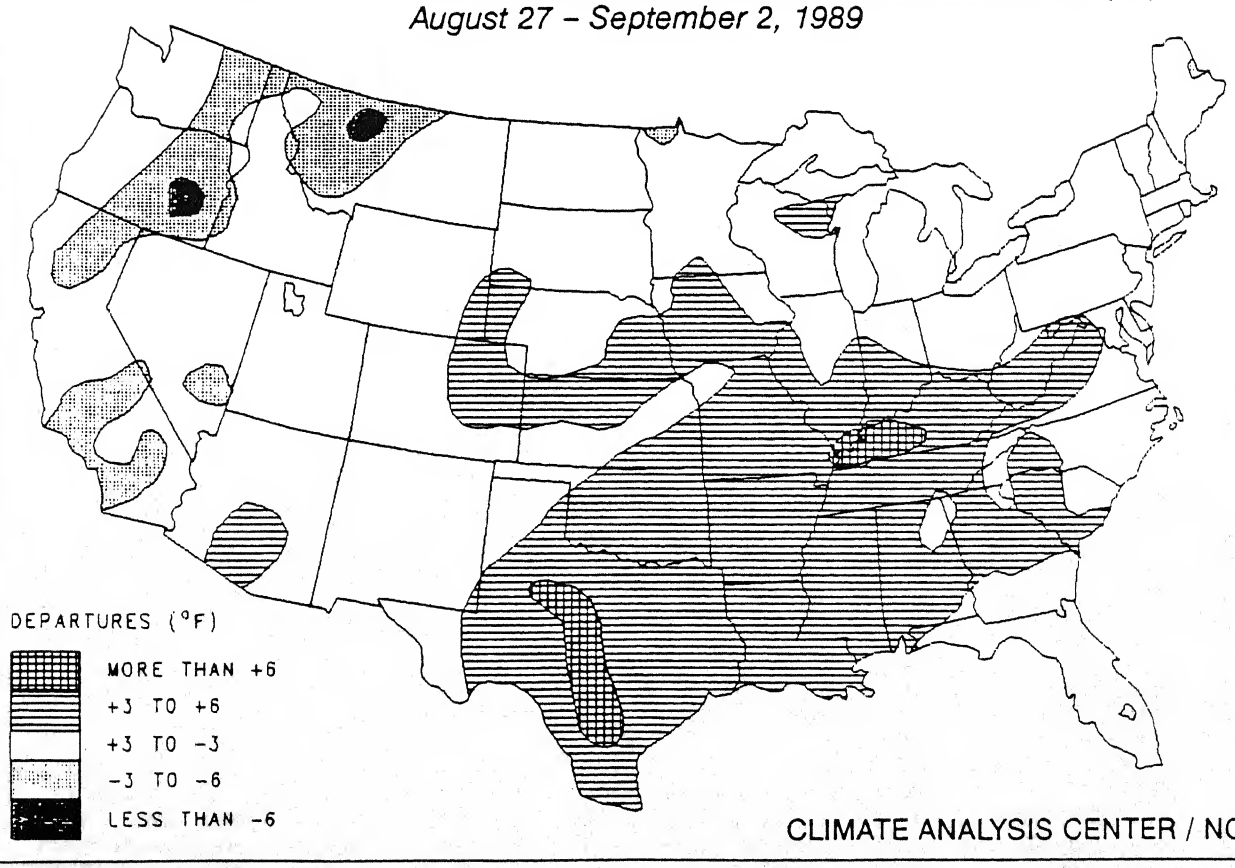
August 27 – September 2, 1989



CLIMATE ANALYSIS CENTER / NOAA

DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

August 27 – September 2, 1989



CLIMATE ANALYSIS CENTER / NOAA

TABLE 2. Selected stations with temperatures averaging 5.0°F or more ABOVE normal for the week.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
FAYETTEVILLE, AR	+7.6	81.8	FORT SMITH, AR	+5.4	84.1
SAN ANTONIO, TX	+6.5	89.4	SCOTTSBLUFF, NE	+5.4	73.2
MONROE, LA	+6.5	86.1	WACO, TX	+5.3	89.0
BIG DELTA, AK	+6.4	58.1	AUSTIN/BERGSTROM AFB, TX	+5.3	88.1
ABILENE, TX	+6.3	87.1	JACKSON, MS	+5.3	85.2
PADUCAH, KY	+6.3	81.3	GREENWOOD, MS	+5.3	84.5
KOTZEBUE, AK	+6.2	54.8	MEMPHIS, TN	+5.3	83.9
BARROW, AK	+6.2	42.2	SAN ANGELO, TX	+5.2	86.0
BATON ROUGE, LA	+6.1	86.6	HARRISON, AR	+5.2	80.5
MERIDIAN, MS	+6.1	85.5	MT. CLEMENS/SELFRIDGE AFB, MI	+5.2	73.1
WEST PLAINS, MO	+6.1	80.0	HOBART, OK	+5.1	84.3
DALLAS/LOVE FIELD, TX	+6.0	89.3	TULSA, OK	+5.1	84.1
BOWLING GREEN, KY	+6.0	81.0	ST. LOUIS, MO	+5.1	79.9
DALLAS/FORT WORTH, TX	+5.7	88.4	MCALLEN, TX	+5.0	89.3
BEEVILLE NAS, TX	+5.6	89.1	TUSCALOOSA, AL	+5.0	84.3
FAIRBANKS, AK	+5.6	58.1	MCALESTER, OK	+5.0	84.1
PHOENIX, AZ	+5.5	93.6	LUBBOCK, TX	+5.0	80.6
MONTGOMERY/MAXWELL AFB, AL	+5.4	85.8			

TABLE 3. Selected stations with temperatures averaging 2.5°F or more BELOW normal for the week.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
BURNS, OR	-7.1	57.1	HELENA, MT	-3.0	58.9
GREAT FALLS, MT	-6.2	57.5	DICKINSON, ND	-2.9	61.0
LOS ANGELES, CA	-5.4	65.1	BISMARCK, ND	-2.9	61.6
MISSOULA, MT	-4.8	57.2	MINOT, ND	-2.8	60.4
HAVRE, MT	-4.7	59.4	ELKO, NV	-2.8	61.4
REDDING, CA	-4.4	75.0	KALISPELL, MT	-2.7	57.4
THERMAL, CA	-4.4	84.1	BOZEMAN, MT	-2.7	58.2
SPOKANE, WA	-4.1	60.9	LEBANON, NH	-2.7	60.8
BAKERSFIELD, CA	-3.8	76.8	DAGGETT, CA	-2.7	81.5
BUTTE, MT	-3.5	53.5	EL PASO, TX	-2.6	76.1
PENDLETON, OR	-3.4	65.5	WILLISTON, ND	-2.5	61.7
SANTA BARBARA, CA	-3.2	63.2	WALLA WALLA, WA	-2.5	68.1
WENATCHEE, WA	-3.2	66.1	PASO ROBLES, CA	-2.5	69.5
CUT BANK, MT	-3.1	55.6			

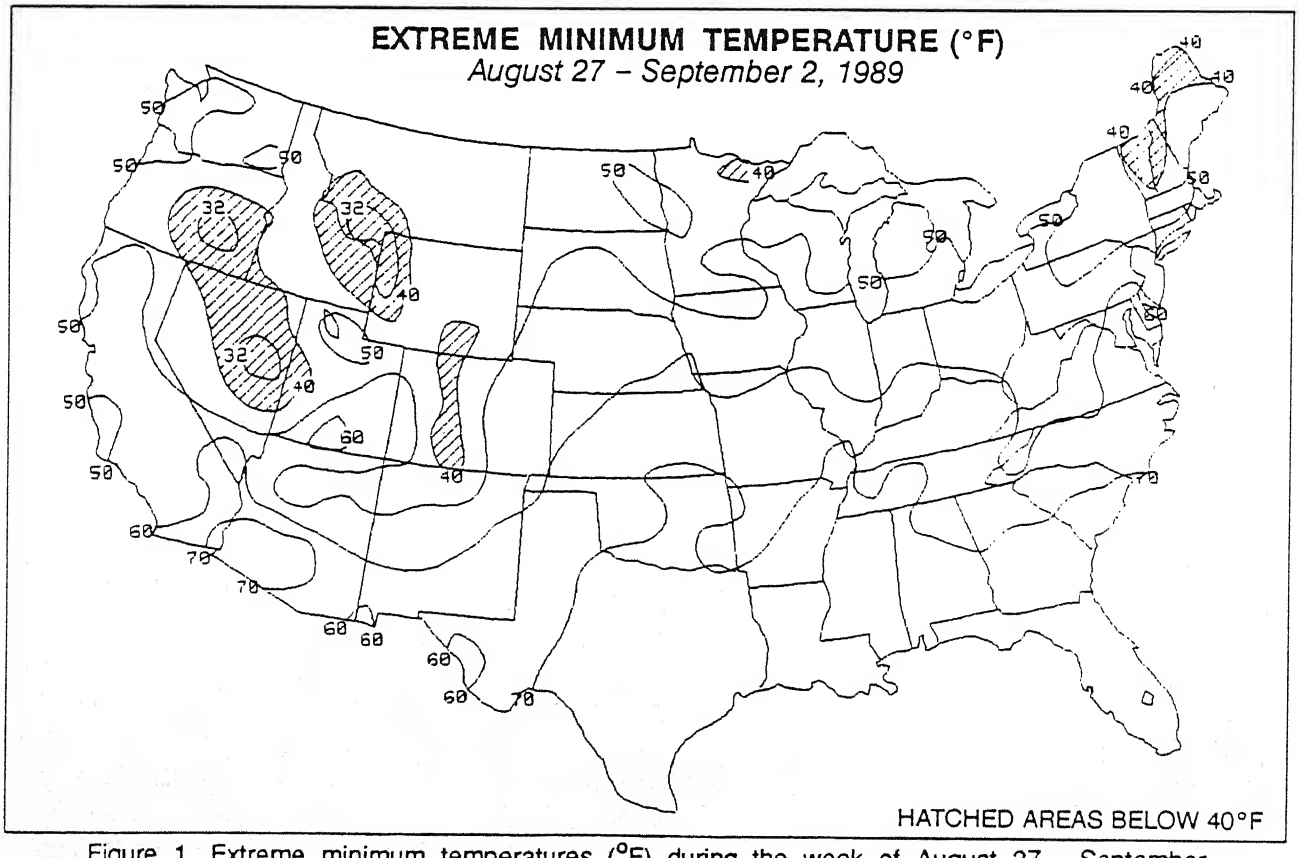
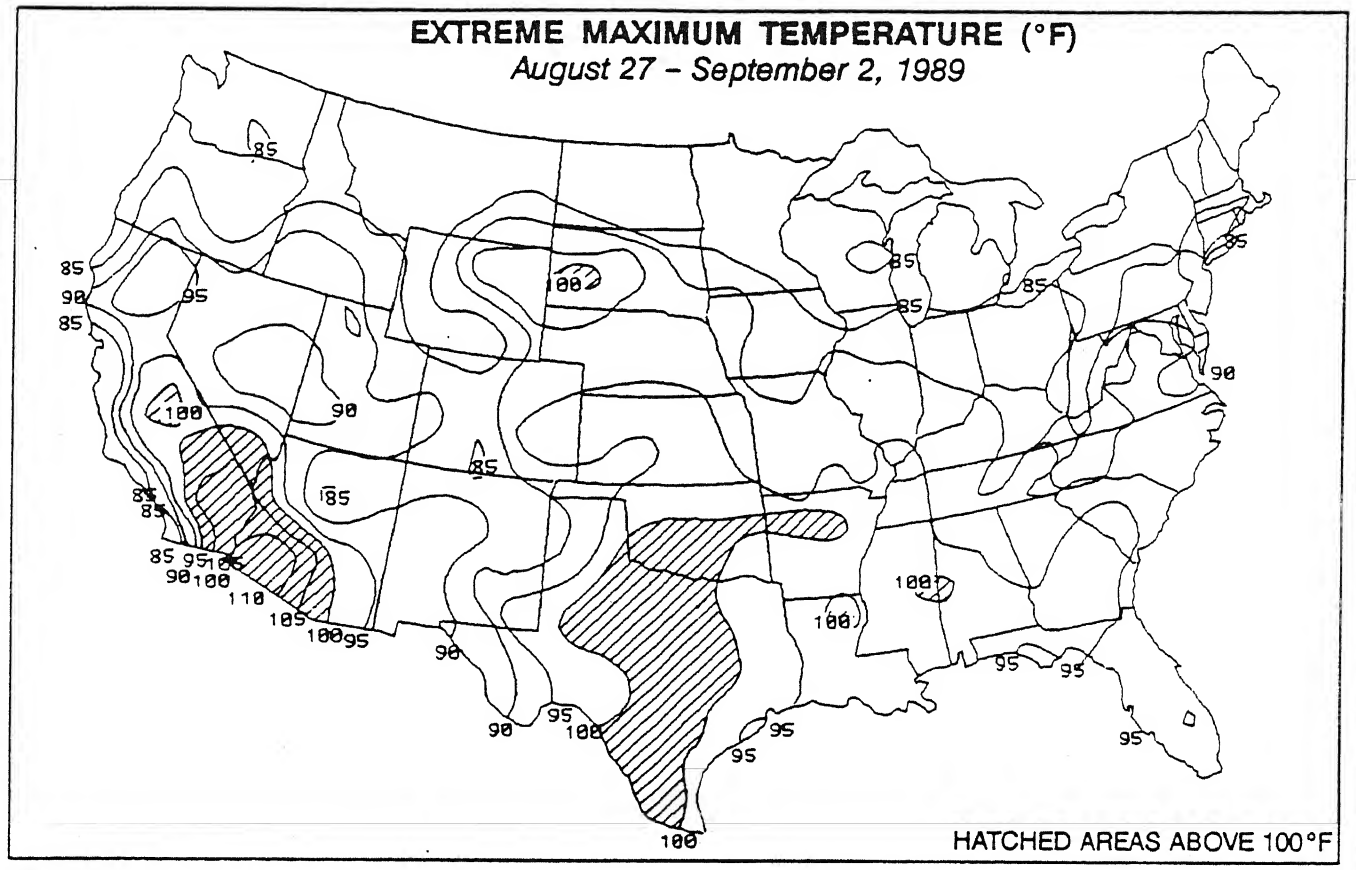


Figure 1. Extreme minimum temperatures (°F) during the week of August 27 - September 2, 1989. With cool air entrenched in the Far West and northern New England, lows dipped below 40°F in parts of the Great Basin, northern and central Rockies, and the northern Appalachians. In contrast, warm, muggy air kept lows in the seventies across the Deep South.



Triple-digit temperatures were found in the desert Southwest and the southern third of the Great Plains (top). High temperatures and humidities resulted in apparent temperatures greater than 100°F in the southeastern quarter of the U.S. with some areas exceeding 110°F (bottom).

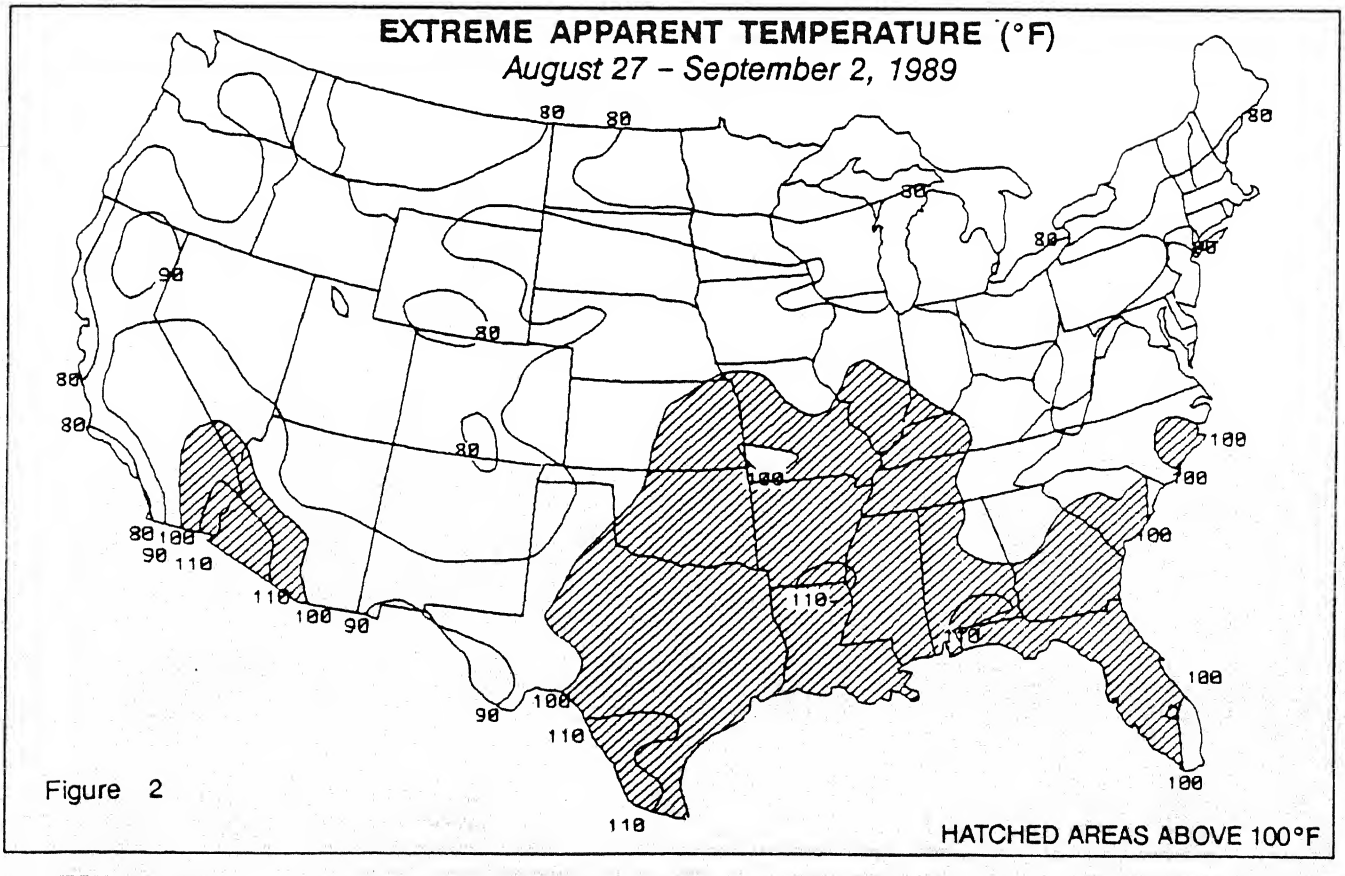
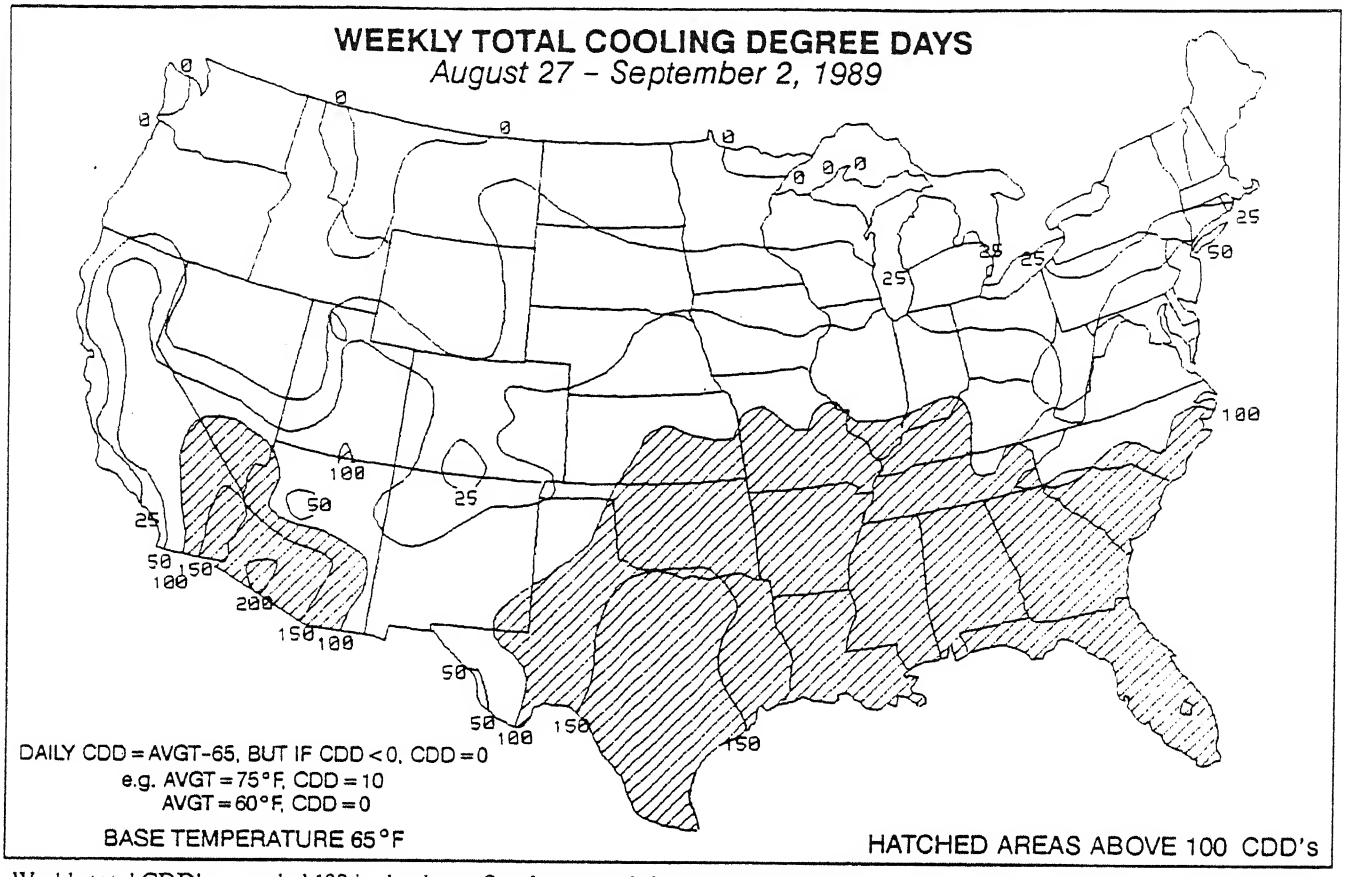
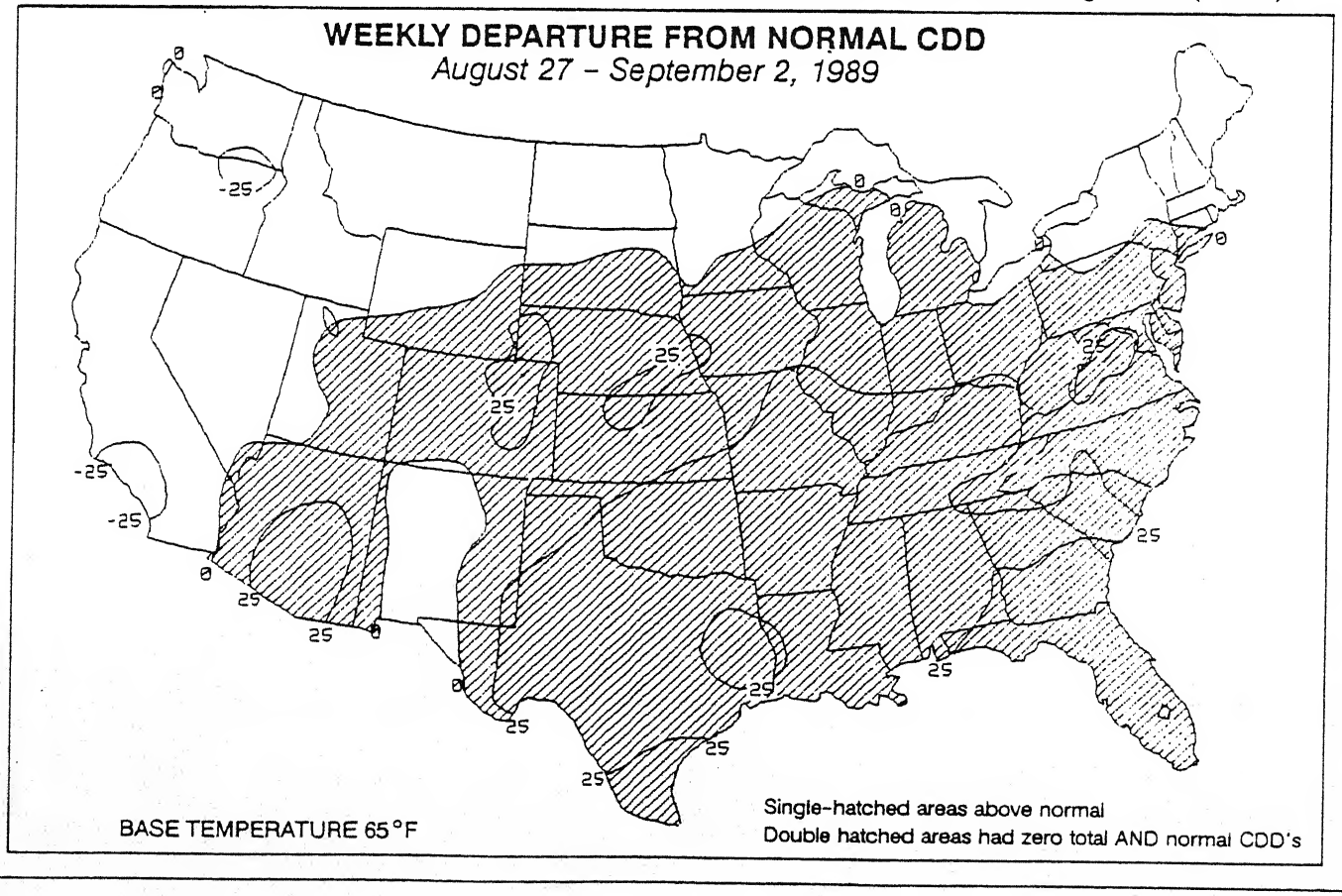


Figure 2

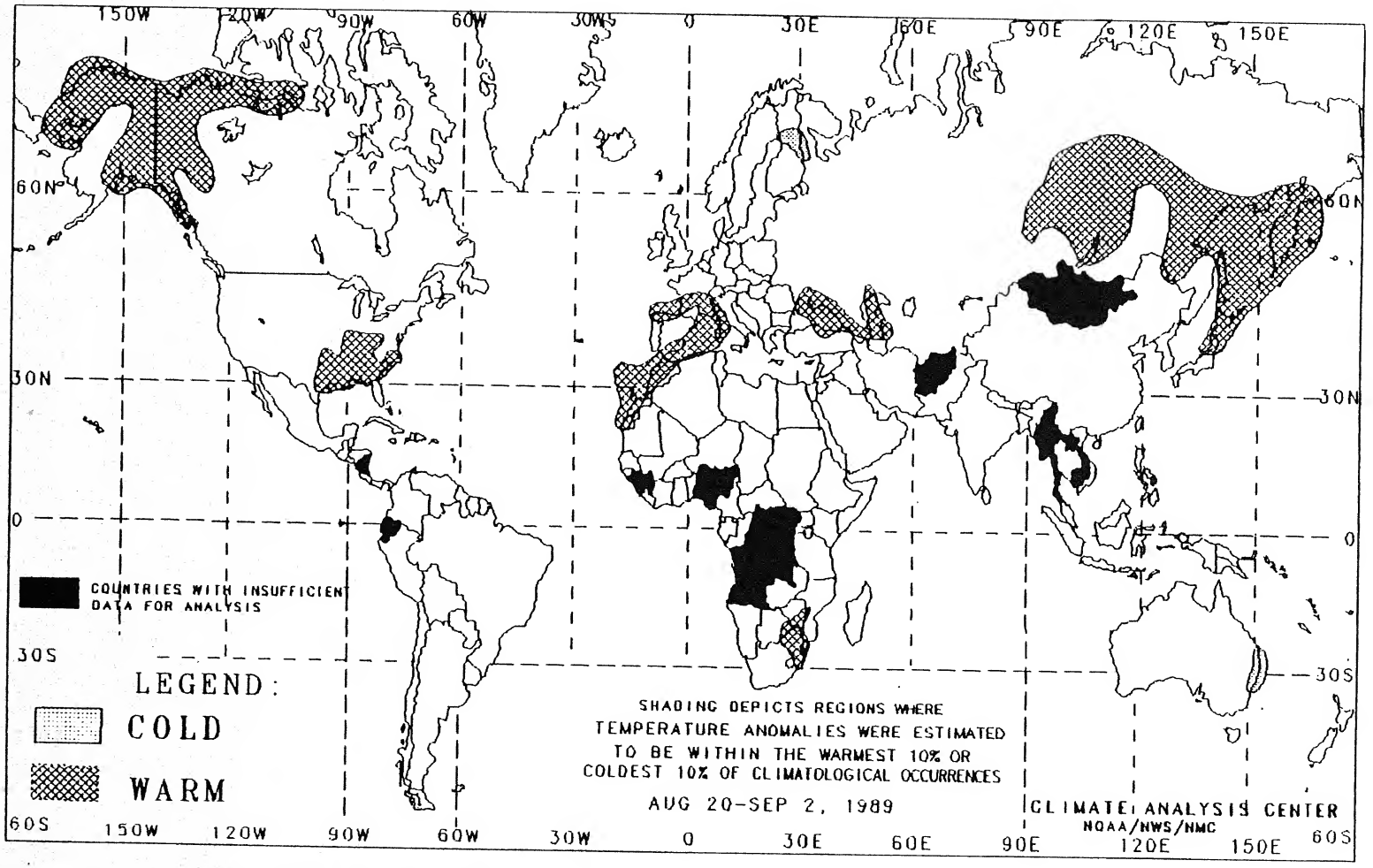


Weekly total CDD's exceeded 100 in the desert Southwest, and the southeastern quarter of the nation (top). Temperatures reached into the 80's as far north as the western Great Lakes and kept air-conditioning demand above normal across most of the eastern two-thirds of the nation while cool conditions in the West and northern Graet Plains lowered the cooling demand (bottom).



GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

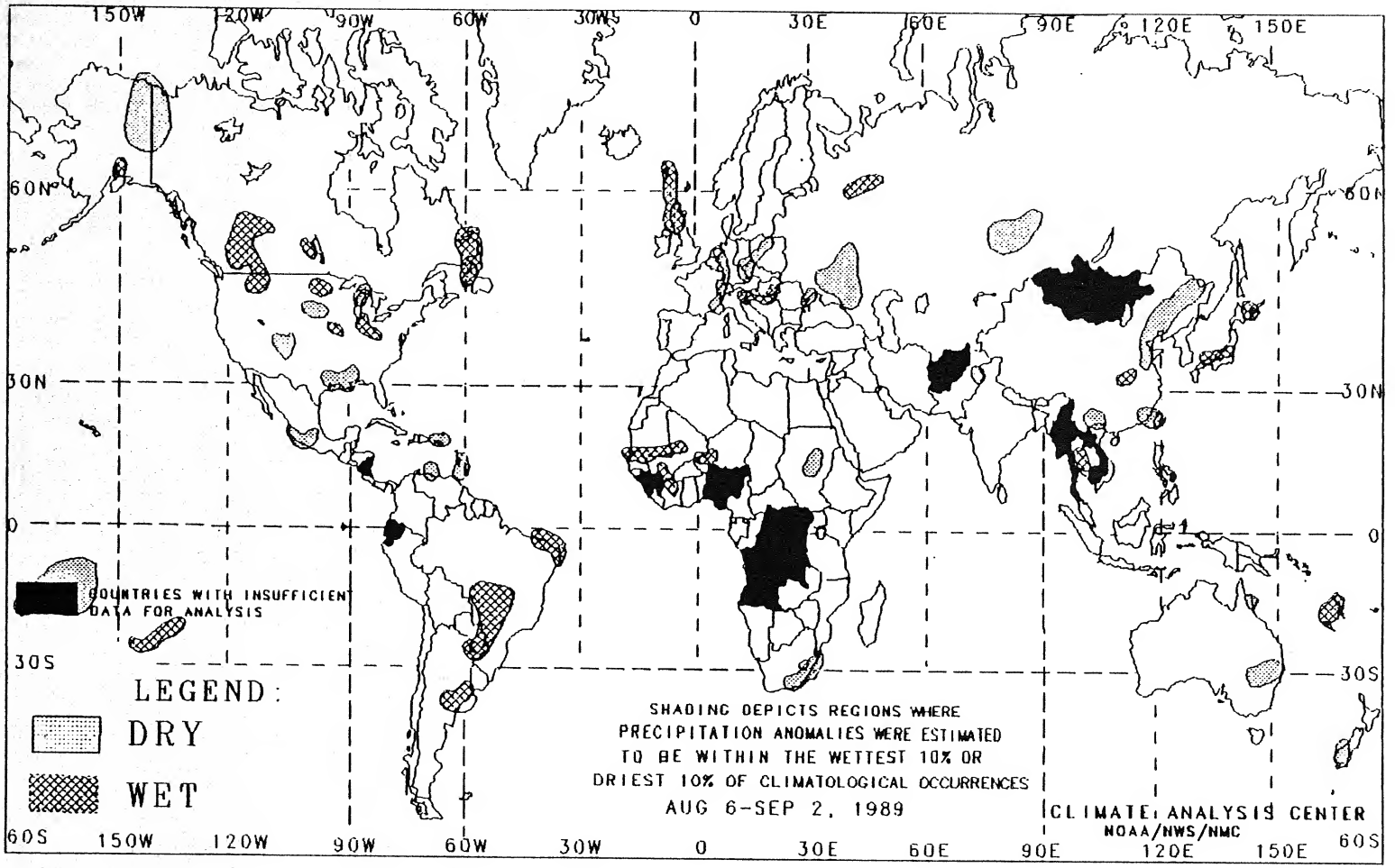
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

UNITED STATES MONTHLY CLIMATE HIGHLIGHTS

AUGUST 1989

After experiencing excessive precipitation during the preceding two months, most of the South and East recorded slightly to much below normal August rainfall. In contrast, heavy rains provided significant relief from long-term dryness to the northern Rockies and Great Plains, upper Midwest, and lower Missouri Valley. After a brief hiatus during July, wet weather resumed in the central Great Plains while the immediate New England and mid-Atlantic Coasts observed the fourth consecutive month of above normal precipitation. This month's temperatures generally averaged near normal across the lower 48 states, a welcome change from a year ago when extreme heat scorched much of the country. Farther north, a persistent upper-air ridge of high pressure anchored over western Canada kept most of Alaska abnormally mild throughout August. Hurricane Chantal formed in the Gulf of Mexico and rapidly intensified, making landfall near Galveston, TX on August 1. Chantal brought torrential rains, several tornadoes, and 85 mph winds to the upper Texas coast. Once inland, however, it quickly lost strength and was classified as a non-tropical system before it reached Oklahoma. A few days later, interaction between an unusually strong cold front sweeping southeastwards out of Canada and moisture from the remnants of Chantal produced badly-needed rains but caused flash flooding across the central Great Lakes and western New England. By the second week of August, unseasonably cool air invaded the eastern half of the nation as over 240 daily minimum temperature records were tied or broken during the period. A strong low pressure center formed off the coast of North Carolina and moved northeastward, dumping heavy rains along the Atlantic Coast. In the desert Southwest, isolated monsoonal showers drenched normally arid Yuma, AZ with over 3.4 inches of rain in a few hours while Benton, CA accumulated nearly a foot in a few days. During mid-August, a couple of slow-moving cold fronts, several upper-air disturbances, and moist air triggered numerous showers and thunderstorms throughout the eastern three-quarters of the U.S. Locally heavy rains inundated the Virginia Tidewater area and southern Delaware with 8-12 inches in just four hours. Subnormal temperatures remained entrenched in the nation's midsection. As September approached, cooler air filtered into the West while oppressive conditions beset the Southeast. Readings in the nineties combined with high humidities to produce dangerous apparent temperatures as great as 123°F at Ozark, AL. On the other hand, the season's first snowfall occurred in parts of Yellowstone and the Grand Tetons. Severe weather developed in the central Great Plains and the Tennessee and middle Mississippi Valleys in response to a stationary front. More than 4 inches of rain soaked Anchorage, AK within a 24-hour period, but many other areas of the state, especially along the extreme southeastern coast, observed subnormal August precipitation. Preliminary estimates on the number of August tornadoes (39) indicated below-normal activity (average=57). However, a very active spring has pushed this year's tornado count well above average (see Figure 1).

According to the River Forecast Centers, the largest monthly amounts (between 8 and 12 inches) were reported in the central Great Plains and at scattered locations in the central Corn Belt, along the southern and middle Atlantic Coasts, and in central New England. Above normal August rains fell on the northern Rockies, in portions of the Intermountain West, across the north-central High Plains and central Great Plains, from eastern North Dakota southeastward to the southern Appalachians, along the northern half of the Atlantic Coast, in New England, and across southern Florida (see Table 1, front cover, and Figure 2). Most Hawaiian stations generally measured near normal August rainfall. Regionally, the West and Northwest observed the fifteenth and eleventh wettest August since 1895, according to the National Climatic Data Center (NCDC). The NCDC national historical precipitation was calculated in a different way in order to more accurately portray the local normal climate. Based upon the new index, August 1989 ranked as the 33rd wettest August on record (for additional information, see Figure 3). Heavy spring and early summer rains brought unusually moist conditions to nearly a tenth of the nation (see Figure 4).

Much drier weather returned to most of the South and mid-Atlantic during August after both regions received ample June and July rains. Even though August is usually one of the wettest months of the year, many locations in the South and East accumulated under 2 inches of rain. Less than half the normal monthly precipitation was recorded in parts of the lower Mississippi Valley and central Gulf, across the Great Lakes region, in the central Appalachians and mid-Atlantic, extreme southern Texas, along the southeastern Alaskan coast, and in the seasonably dry sections of the Far West (see Table 2, front cover, and Figure 2). Severe or extreme long-term drought is still afflicting nearly a third of the contiguous U.S. (see Figure 5).

At most locations in the lower 48 states, August temperatures averaged within 2°F of normal. The only notable exceptions included central Arizona, extreme southern Texas, the northern Great Plains, and the upper Midwest where positive departures ranged between +2°F and +4°F (see Figures 6 and 7). In Alaska, mild conditions prevailed throughout August in response to an upper-level ridge over western Canada as almost every station in the state reported above normal monthly temperatures (see Table 3).

An outbreak of unseasonably cool air from Canada during the second and third weeks of August greatly contributed to subnormal monthly temperatures in the nation's midsection and the East. The greatest negative departures (between -2°F and -4°F) were found in the south-central Great Plains and lower Missouri Valley (see Table 4, Figures 6 and 7). Intrusions of cold air into the Pacific Northwest and northern Rockies during early and late August kept monthly temperatures 2°F to 4°F below normal. As a result, the West, Northwest, Central, and South regions as defined by the NCDC were characterized by slightly cooler than normal conditions during August.

TEMPERATURE AND PRECIPITATION RANKINGS FOR AUGUST 1989, BASED ON THE PERIOD 1895 - 1989 (95 YEARS) WHERE 1 = DRIEST/COLDEST AND 95 = WETTEST/HOTTEST

REGION	*PRECIPITATION*	*TEMPERATURE*
NORTHEAST	60	44
EAST NORTH CENTRAL	66	56
CENTRAL	60	27
SOUTHEAST	36	39
WEST NORTH CENTRAL	70	51
SOUTH	43	20
SOUTHWEST	33	31
NORTHWEST	85	19
WEST	81	22
NATIONAL	57	24

National Climatic Data Center

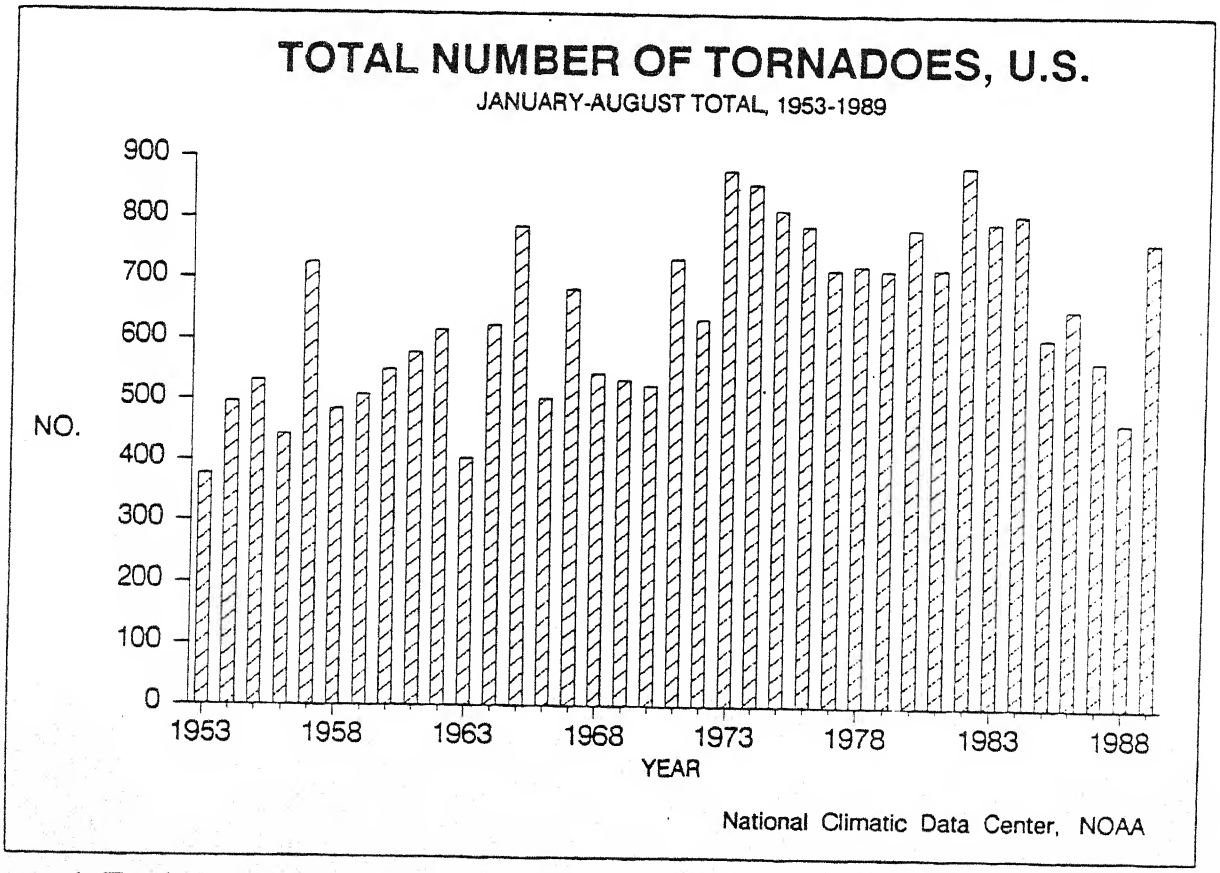


Figure 1. Total number of tornadoes during January–August, 1953–1989. Even though the preliminary count of this August's tornadoes (39) was below the long–term average of 57, a very active Spring has pushed this year's number of tornadoes well above normal (762 versus an average of 643).

TABLE 1. AUGUST STATIONS WITH MORE THAN 150% OF NORMAL PRECIPITATION AND MORE THAN 6 INCHES OF PRECIPITATION; OR, STATIONS WITH MORE THAN 7 INCHES OF PRECIPITATION AND NO NORMALS.

STATION	TOTAL (INCHES)	PCT. OF NORMAL	STATION	TOTAL (INCHES)	PCT. OF NORMAL
MIAMI, FL	12.78	182.6	SAVANNAH/HUNTER AFB, SC	7.20	***
MONTPELIER, VT	10.65	319.8	HOUSTON/ELLINGTON AFB, TX	7.15	***
ILIAMNA, AK	10.36	201.9	NEWARK, NJ	7.00	163.2
ANCHORAGE, AK	9.76	464.8	HUNTINGTON, WV	6.94	180.3
HOUSTON/WM. HOBBY, TX	9.72	***	HUNTSVILLE, AL	6.83	219.6
WICHITA/MC CONNELL AFB, KS	9.22	***	HARTFORD, CT	6.80	170.9
NEWPORT NEWS/HENRY NDB, VA	8.98	***	ALEXANDRIA, MN	6.63	184.2
HAMPTON/LANGLEY AFB, VA	8.34	174.8	DES MOINES, IA	6.53	159.7
TALKEETNA, AK	8.24	186.9	MADISON, WI	6.46	170.0
INDIANAPOLIS, IN	8.05	234.0	ANNISTON, AL	6.41	168.7
ELKINS, WV	7.98	226.1	ROCKFORD, IL	6.23	168.8
PARKERSBURG, WV	7.89	220.4	TOPEKA, KS	6.22	168.6
HOMESTEAD AFB, FL	7.89	***	OTTUMWA, IA	6.22	155.1
GALVESTON, TX	7.78	180.5	BLUEFIELD, WV	6.21	184.3
MILLVILLE, NJ	7.72	168.6	WICHITA FALLS, TX	6.17	291.0
KANSAS CITY/INTL, MO	7.38	194.7	MOLINE, IL	6.17	165.0
CHICAGO/O'HARE, IL	7.31	205.9	RUMFORD, ME	6.14	166.9
BURLINGTON, VT	7.30	189.6	PROVIDENCE, RI	6.14	152.7
COLUMBIA, MO	7.24	223.5	ENID/VANCE AFB, OK	6.09	178.6
GLENVIEW NAS, IL	7.23	***	FARGO, ND	6.07	229.1
NEW YORK/LA GUARDIA, NY	7.21	167.7			

(Note: Stations without precipitation normals are indicated by asterisks.)

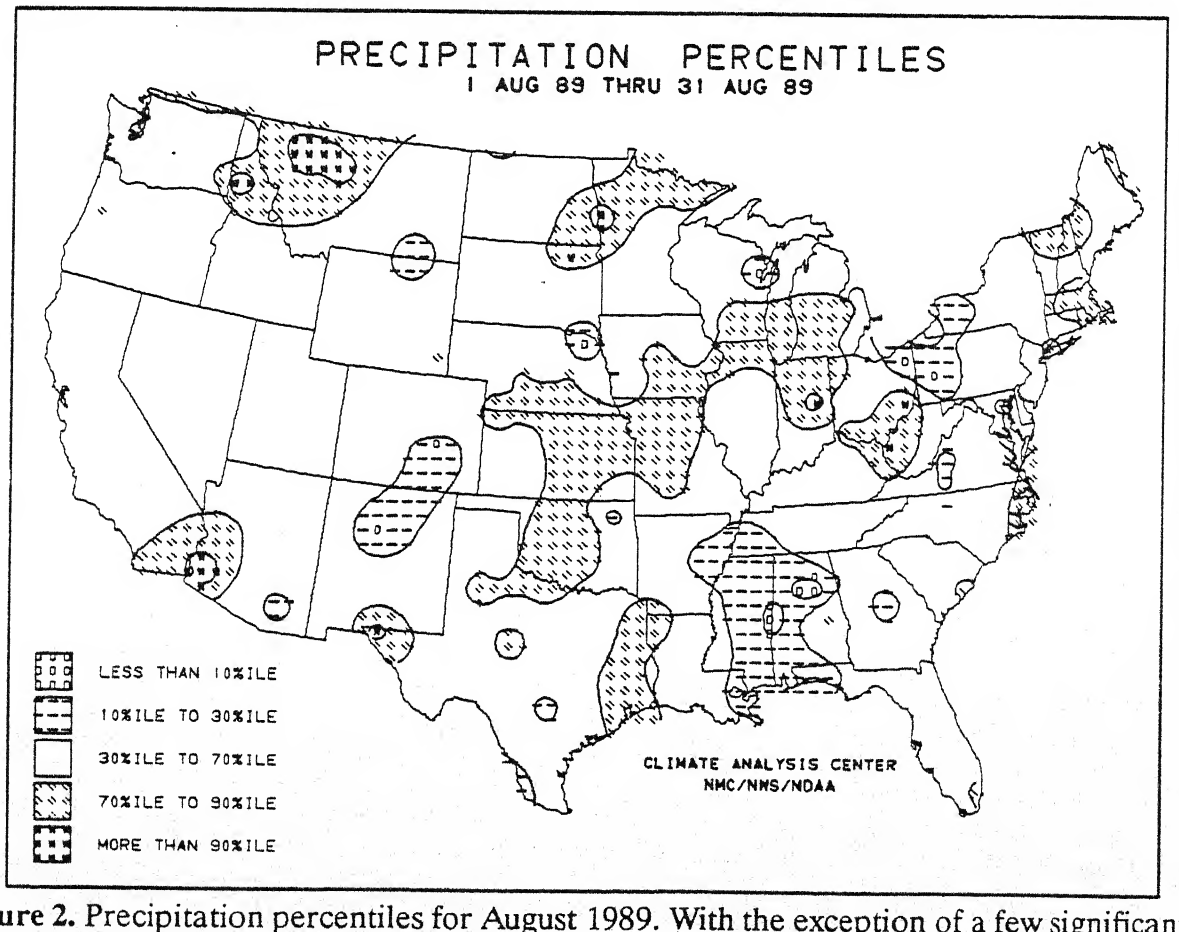


Figure 2. Precipitation percentiles for August 1989. With the exception of a few significantly wet (eg. western Montana, southwestern Arizona) and dry (eg. central Alabama and Mississippi) areas, most of the contiguous U.S. experienced near normal August precipitation.

TABLE 2. AUGUST STATIONS WITH LESS THAN 50% OF NORMAL PRECIPITATION THAT HAVE MORE THAN THREE INCHES OF NORMAL PRECIPITATION.

STATION	TOTAL (INCHES)	PCT. OF NORMAL	NORMAL (INCHES)	STATION	TOTAL (INCHES)	PCT. OF NORMAL	NORMAL (INCHES)
ALTOONA, PA	0.01	0.3	3.23	HANCOCK, MI	1.42	42.1	3.37
PALACIOS, TX	0.26	6.3	4.14	MEMPHIS, TN	1.43	38.4	3.72
FORT BELVOIR/DAVISON, VA	0.29	6.6	4.40	DANVILLE, VA	1.56	35.2	4.43
JONESBORO, AR	0.34	10.4	3.26	ROANOKE, VA	1.65	42.4	3.89
WASHINGTON/ANDREWS, MD	0.55	12.5	4.40	BRUNSWICK NAS, ME	1.66	42.2	3.93
UNALAKLEET, AK	0.68	21.6	3.15	YOUNGSTOWN, OH	1.68	48.7	3.45
MERIDIAN, MS	0.72	21.4	3.36	CHATHAM, MA	1.74	42.8	4.07
WASHINGTON/DULLES, VA	0.76	18.6	4.09	JACKSON, MS	1.74	48.6	3.58
MARTINSBURG, WV	0.95	26.3	3.61	SPENCER, IA	1.81	46.2	3.92
LITTLE ROCK, AR	0.98	32.1	3.05	ANDERSON, SC	1.82	48.9	3.72
BIRMINGHAM, AL	1.01	26.4	3.83	BUFFALO, NY	1.84	44.4	4.14
FINDLAY, OH	1.01	31.8	3.18	BILOXI/KEESLER AFB, MS	1.86	29.7	6.26
GREEN BAY, WI	1.05	33.4	3.14	WILMINGTON, DE	1.94	48.1	4.03
CLEVELAND, OH	1.09	32.4	3.36	SITKA, AK	1.98	29.9	6.63
PITTSBURGH, PA	1.12	34.0	3.29	VALPARAISO/EGLIN AFB, FL	2.12	29.5	7.19
AKRON, OH	1.13	34.4	3.29	ANNETTE ISLAND, AK	2.33	31.9	7.31
WASHINGTON/NATIONAL, DC	1.15	26.3	4.38	PENSACOLA, FL	2.60	36.9	7.04
MUSCLE SHOALS, AL	1.23	40.2	3.06	LAKE CHARLES, LA	2.72	49.9	5.45
BELLEVILLE/SCOTT AFB, IL	1.24	31.0	4.00				

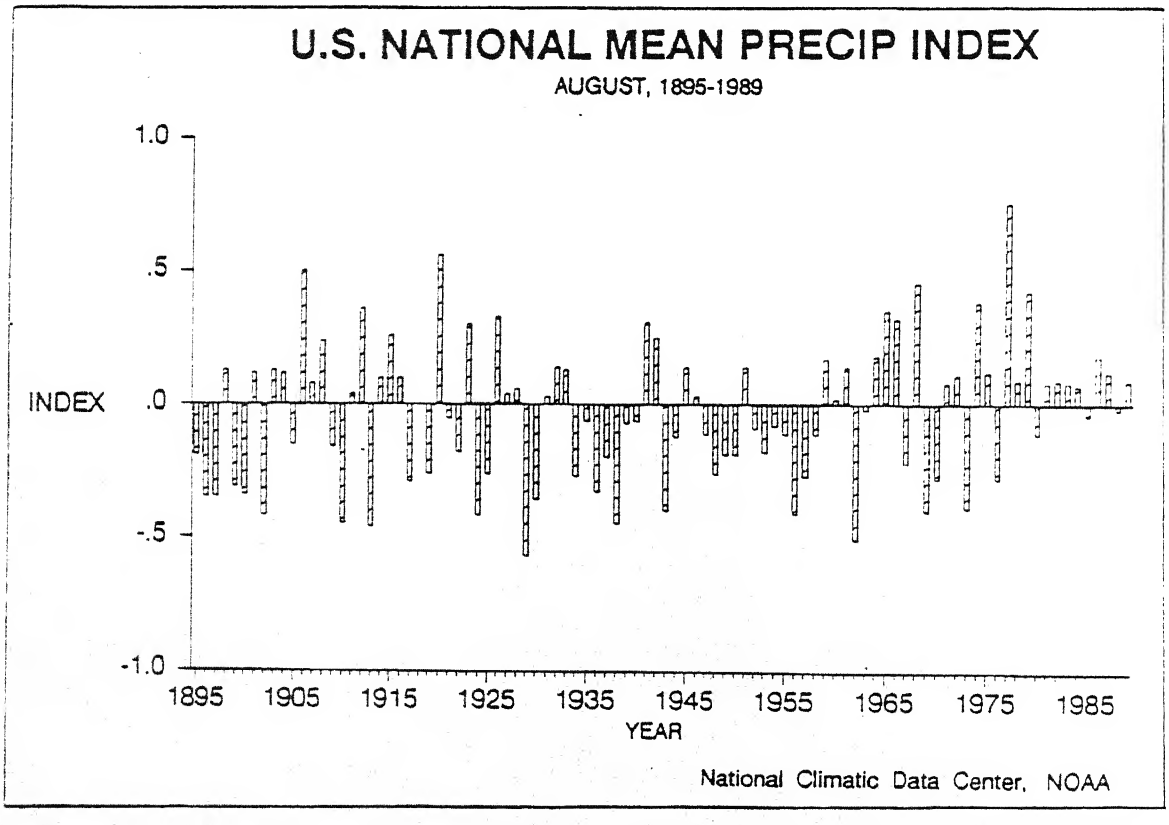


Figure 3. U.S. National mean August precipitation index for the period 1895–1989 obtained from the National Climatic Data Center (NCDC). Since the East is normally wetter than large parts of the West during the summer, precipitation in the eastern U.S. will dominate precipitation in the western U.S. To offset this problem, the different parts of the country can be better compared directly if their precipitation is first standardized according to each region's normal climate regime. In this graph, the August rainfall for each climate division in the country (344) was first standardized using the gamma distribution over the 1951–1980 period. These standardized values were then weighted by area and averaged to determine a national standardized precipitation value. Negative values are dry, positive values are wet. The resultant index portrays a more accurate indication of how precipitation across the nation compares to the local normal climate. Nationally, this August's rainfall was slightly above normal and was ranked as the 33rd wettest August on record.

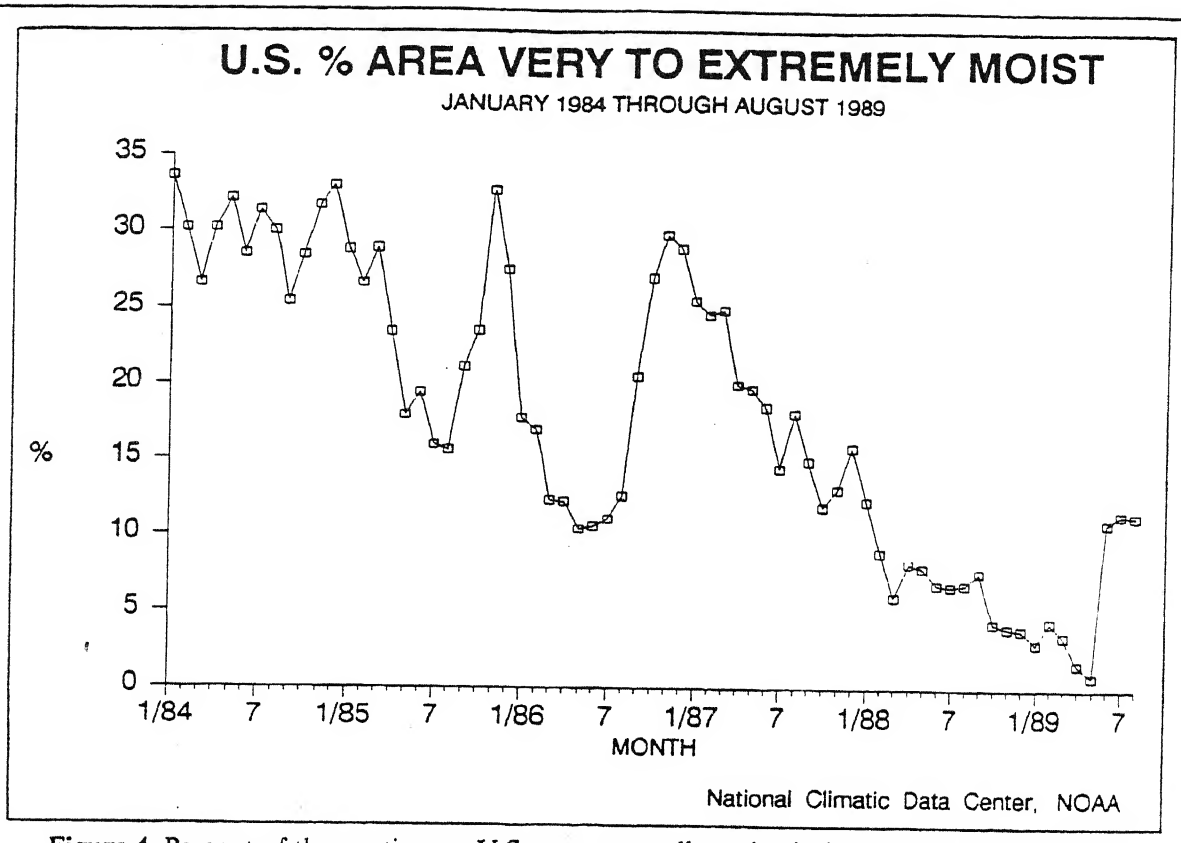


Figure 4. Percent of the contiguous U.S. area unusually moist during January 1984–August 1989. The category of unusually moist is defined for any Palmer Drought Index greater than +3. Spring and early summer rains, especially in the South and East, brought unusual wetness to nearly a tenth of the country.

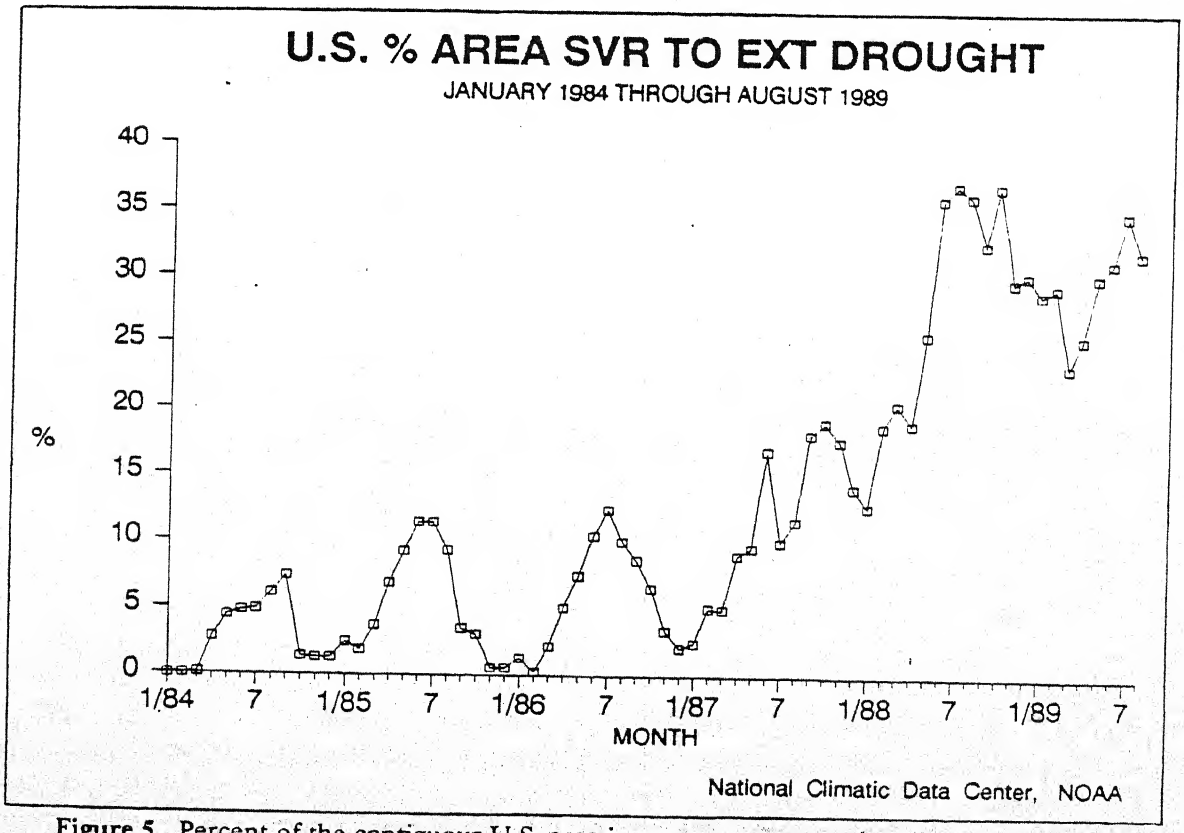


Figure 5. Percent of the contiguous U.S. area in severe or extreme drought during January 1984–August 1989. The category of severe drought (extreme drought) is defined for any Palmer Drought Index between –3.0 and –4.0 (less than –4.0). Nearly one third of the nation, especially in the West, northern Great Plains, and western Corn Belt, is still experiencing severe or extreme long-term dryness.

TABLE 3. AUGUST AVERAGE TEMPERATURES 2.5°F OR MORE ABOVE NORMAL.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
BARROW, AK	+9.2	47.1	TALKEETNA, AK	+2.9	57.9
FAIRBANKS, AK	+4.5	60.9	MCGRATH, AK	+2.8	57.1
NORTHWAY, AK	+4.3	58.0	KODIAK, AK	+2.7	57.4
HOMER, AK	+4.2	56.9	ILIAMNA, AK	+2.7	56.7
PHOENIX, AZ	+3.8	93.7	YAKUTAT, AK	+2.7	55.8
GULKANA, AK	+3.6	57.2	GLENDALE/LUKE AFB, AZ	+2.5	90.9
BARTER ISLAND, AK	+3.5	42.5	MCALLEN, TX	+2.5	87.4
JUNEAU, AK	+3.4	58.1	BEEVILLE NAS, TX	+2.5	87.2
KING SALMON, AK	+3.4	57.3	TUCSON, AZ	+2.5	86.5
BIG DELTA, AK	+3.2	59.0	PIERRE, SD	+2.5	76.1
ANCHORAGE, AK	+3.0	59.2	GRAND FORKS, ND	+2.5	69.4
SITKA, AK	+3.0	58.4	KENAI, AK	+2.5	56.1

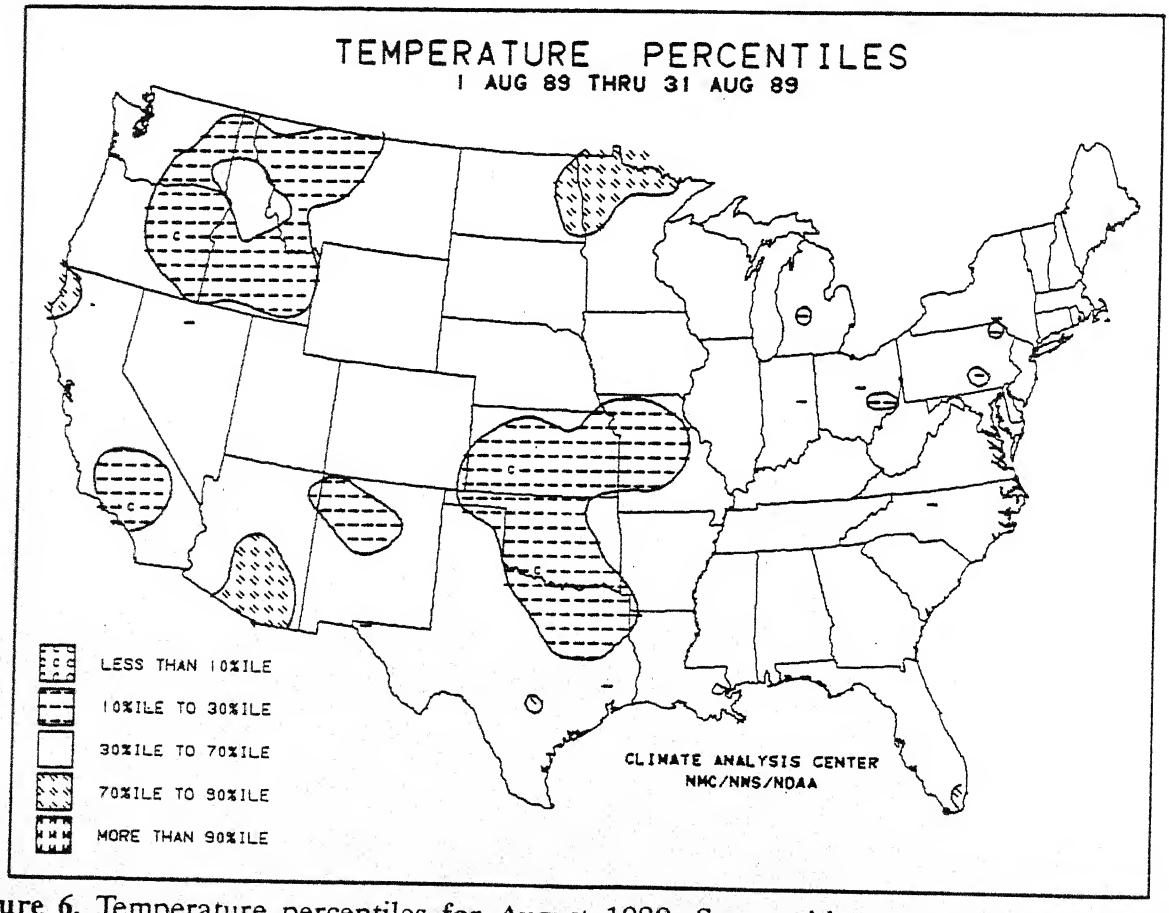


Figure 6. Temperature percentiles for August 1989. Seasonable temperatures prevailed across most of the country during August as only a few areas were in the lower 30th (eg. northern Rockies, central Great Plains) or upper 30th (eg. upper Midwest, southern Arizona) percentile.

TABLE 4. AUGUST AVERAGE TEMPERATURES 2.5°F OR MORE BELOW NORMAL.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
BURNS, OR	-5.8	61.4	LOS ANGELES, CA	-2.9	67.6
ENID/VANCE AFB, OK	-4.2	78.0	OKLAHOMA CITY, OK	-2.9	78.3
REDDING, CA	-3.6	77.5	GAGE, OK	-2.8	77.2
GREAT FALLS, MT	-3.4	64.0	WALLA WALLA, WA	-2.7	71.2
WICHITA FALLS, TX	-3.4	81.0	KANSAS CITY/INTL., MO	-2.7	75.6
PASO ROBLES, CA	-3.3	69.9	WICHITA, KS	-2.7	77.0
FT. SILL/HENRY POST AAF, OK	-3.3	79.8	DALLAS/FORT WORTH, TX	-2.7	82.2
SPOKANE, WA	-3.2	64.8	COLUMBIA, MO	-2.5	74.1
DODGE CITY, KS	-3.2	75.0	HOBART, OK	-2.5	79.5
PENDLETON, OR	-3.1	68.7	BAKERSFIELD, CA	-2.5	79.9

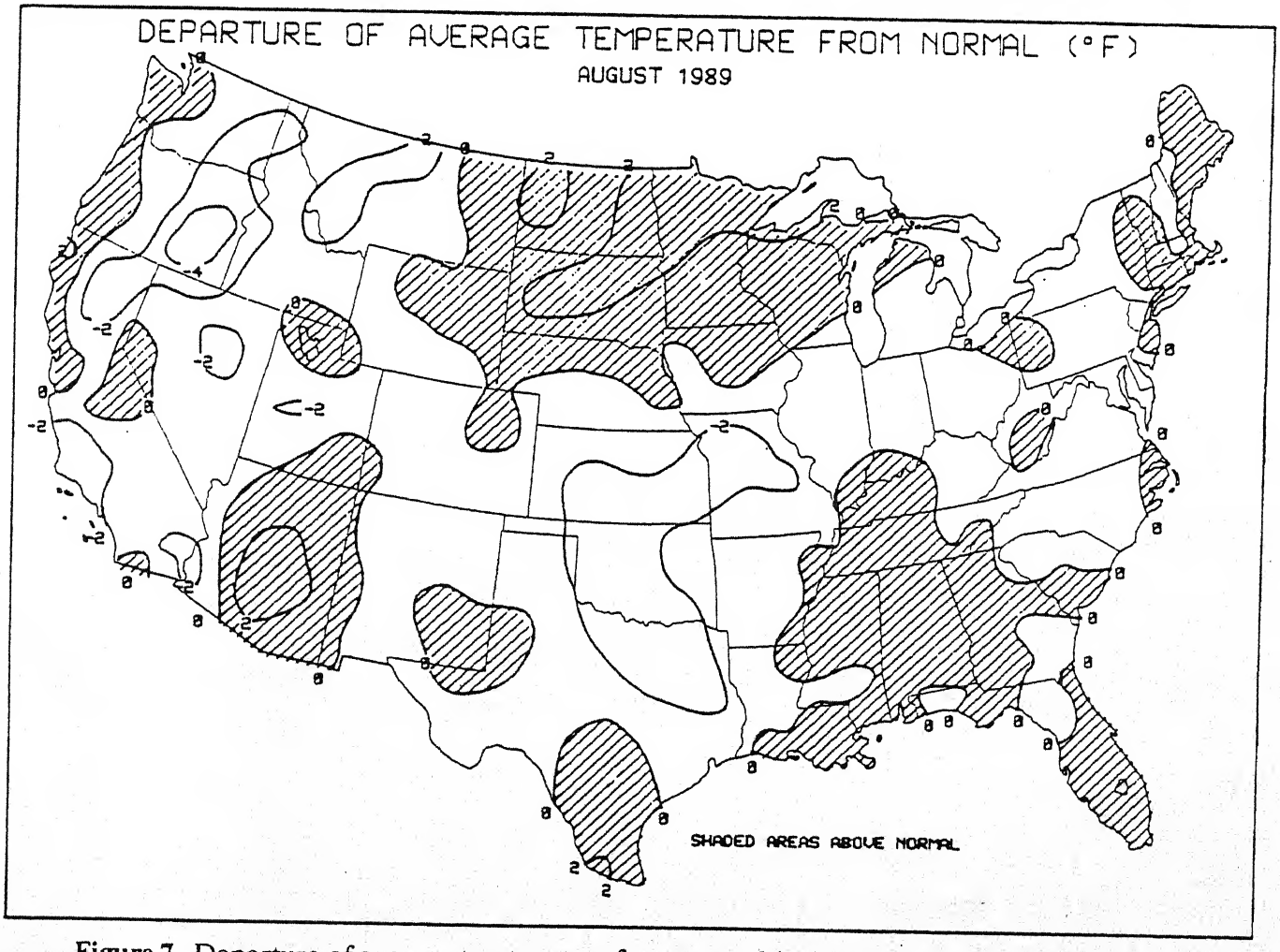


Figure 7. Departure of average temperature from normal (°F) during August 1989. Monthly temperatures at most locations were generally within 2°F of normal with the exception of the upper Midwest, the central Great Plains, and the northern Rockies. Farther north, unseasonably mild conditions prevailed throughout Alaska as departures reached +9°F at Barrow.

TABLE 5. RECORD AUGUST TOTAL PRECIPITATION.

STATION	TOTAL (INCHES)	NORMAL (INCHES)	PCT. OF NORMAL	RECORD TYPE	RECORDS BEGAN
ANCHORAGE, AK	9.76	2.10	464.8	HIGHEST	1941
HUNTINGTON, WV	6.94	3.85	180.3	HIGHEST	1947
HAVRE, MT	4.02	1.22	329.5	HIGHEST	1880
YUMA, AZ	3.44	0.41	839.0	HIGHEST	1949
LEWISTON, ID	2.96	0.80	370.0	HIGHEST	1951
WASHINGTON/DULLES, VA	0.76	4.09	18.6	LOWEST	1963
MERIDIAN, MS	0.72	3.36	21.4	LOWEST	1951
FT. BELVOIR/DAVISON AAF, VA	0.29	4.40	6.6	LOWEST	1957

Note: Trace precipitation is considered no precipitation. Stations with no precipitation are only included if normal precipitation is 0.25 inches or more.

TABLE 6. RECORD AUGUST AVERAGE TEMPERATURES.

STATION	AVERAGE (°F)	NORMAL (°F)	DEPARTURE (°F)	RECORD TYPE	RECORDS BEGAN
BARROW, AK	47.1	37.9	+9.2	HIGHEST	1921
HOMER, AK	56.9	52.7	+4.2	HIGHEST	1951

TABLE 7. RECORD AUGUST EXTREME TEMPERATURES.

STATION	EXTREME (°F)	DATE	RECORD TYPE	RECORDS BEGAN
DAYTONA BEACH, FL	100	7 AUG 89	HIGHEST	1944
VICTORIA, TX	63	10 AUG 89	LOWEST	1961
HOUSTON, TX	62	10 AUG 89	LOWEST	1970
LAKE CHARLES, LA	61	9 AUG 89	LOWEST	1962
JACKSON, MS	55	9 AUG 89	LOWEST	1963
MIDLAND, TX	54	8 AUG 89	LOWEST	1949
SAN ANGELO, TX	54	9 AUG 89	LOWEST	1948